

METHOD OF FORMING A TRAPEZOIDALLY SHAPED SLEEVE  
HAVING A PRINTED LOWER PORTION

CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This application is a continuation of U.S. Serial No. 10/322,140, filed December 16, 2002, which is a continuation of U.S. Serial No. 09/738,655, filed December 15, 2000, now U.S. Patent No. 6,521,075, which is a continuation of U.S. Serial No. 09/288,345, filed April 8, 1999, now U.S. Patent No. 6,183,590, issued February 6, 2001, the contents of each being hereby expressly incorporated herein by reference.

STATEMENT REGARDING FEDERALLY SPONSORED  
RESEARCH OR DEVELOPMENT

**[0002]** Not applicable.

BACKGROUND OF THE INVENTION

1. Field of the Invention.

**[0003]** The present invention relates generally to manufacturing floral sleeves, and more particularly, but not by way of limitation, to a method of manufacturing a plurality of floral sleeves with an ornamental design printed on only a portion of each floral sleeve.

2. Brief Description of the Related Art.

**[0004]** Sleeves used for wrapping floral groupings and potted plants are well known in the art. Such sleeves are generally fabricated of a flexible sheet material and have an open upper end and an open or closed bottom end. The flexibility of the material permits the sleeves to be expanded into a frusto-conically shaped tube and to be flattened into a trapezoidally shaped configuration. Sleeves can be formed from a pair of webs, a single

folded web, or a tubular web. Regardless of the form of the material used, overlapping portions are transversely sealed together to form a pair of sealed edges extending from the upper end of the sleeve to the bottom of the sleeve. To reduce waste, sleeves are formed so as to be inverted relative to the adjacent sleeves and so that adjacent sleeves share a common edge. The web is then cut along the sealed edges to form the sleeves.

**[0005]** In the manufacturing of sleeves, it is often desirable that the sleeve be provided with decorative designs or patterns on a lower portion of the sleeve while leaving the upper portion of the sleeve relatively unobstructed for viewing of the floral grouping through the sleeve. Problems have been encountered in the manufacture of sleeves with printed lower portions, however, in that the printed design is not printed uniformly about the entire lower portion of the sleeve. That is, an unprinted section or strip remains adjacent the sealed edge. Alternatively, the printed design on the lower portion overlaps onto the upper portion of the adjacent sleeve.

**[0006]** In an effort to overcome the above mentioned problems, U.S. Patent No. 5,496,252, issued to Scott Robert Gilbert, discloses a method of forming a plurality of floral sleeves that do not have unprinted edges and which do not have printing overlap in the upper portion thereof. However, this method requires that a significant amount of material be wasted in that an amount of material for forming more than one half a sleeve every other sleeve formed is discarded.

**[0007]** To this end, a need exists for a method of forming a plurality of floral sleeves having a uniform design or pattern imprinted circumferentially thereabout without requiring

the waste of significant portions of sheet material. It is to such a method that the present invention is directed.

### BRIEF SUMMARY OF THE INVENTION

**[0008]** The present invention is directed to a method of forming a plurality of sleeves wherein each of the sleeves has an upper portion and a lower portion, with the lower portion having a printed portion extending continuously about the circumference of the lower portion of the sleeve, the method comprising providing a first web portion having a plurality of successive printed portions extending along a longitudinal axis of the first web portion in a staggered, inverted relationship and a plurality of corresponding unprinted portions. Each printed portion of the first web portion has a top edge, a bottom edge, a first side edge, and a second side edge. The first and second side edges of each printed portion of the first web portion is angled outwardly from the bottom edge to the top edge and the first side edge of each printed portion is coextensive with the first side edge of one of the adjacent printed portions. The second side edge of each printed portion is coextensive with the second side edge of the oppositely adjacent printed portion.

**[0009]** A second web portion is provided. The second web portion has a plurality of successive printed portions extending along a longitudinal axis of the second web portion in a staggered, inverted relationship and a plurality of corresponding unprinted portions. Each printed portion of the second web portion has a top edge, a bottom edge, a first side edge, and a second side edge. The first and second side edges of each printed portion is angled outwardly from the bottom edge to the top edge. The first side edge of each printed portion is coextensive with the first side edge of one of the adjacent printed

portions and the second side edge of each printed portion is coextensive with the second side edge of the oppositely adjacent printed portion.

**[0010]** The first web portion is positioned on the second web portion such that the printed portions of the first web portion are superimposed over the printed portions of the second web portion and such that the unprinted portions of the first web portion are superimposed over the unprinted portions of the second web portion.

**[0011]** Finally, the first and second web portions are sealed and severed along lines defined by the coextensive first sides edges and the coextensive second side edges of each of the printed portions thereby forming a plurality of sleeves wherein each sleeve has an upper portion and a lower portion with the lower portion having a printed portion extending continuously about the exterior circumference of the lower portion of the sleeve while the upper portion is free of any printing contained in the lower portion of an adjacently formed sleeve.

**[0012]** In another aspect, the present invention is directed to a method of forming a plurality of sleeves by providing a pair of web portions. The first web portion has a plurality of successive printed portions extending along a longitudinal axis of the first web portion in a staggered, inverted relationship and a plurality of corresponding unprinted portions. Each printed portion of the first web portion has a top edge, a bottom edge, a first side edge, and a second side edge. The first and second side edges of each printed portion is angled outwardly from the bottom edge to the top edge and the first side edge of each printed portion is substantially aligned with the first side edge of one of the

adjacent printed portions and the second side edge of each printed portion being substantially aligned with the second side edge of the oppositely adjacent printed portion.

**[0013]** A second web portion is provided having a plurality of successive printed portions extending along a longitudinal axis of the second web portion in a staggered, inverted relationship and a plurality of corresponding unprinted portions is provided. Each printed portion of the second web portion has a top edge, a bottom edge, a first side edge, and a second side edge. The first and second side edges of each printed portion are angled outwardly from the bottom edge to the top edge. The first side edge of each printed portion is substantially aligned with the first side edge of one of the adjacent printed portions and the second side edge of each printed portion is substantially aligned with the second side edge of the oppositely adjacent printed portion.

**[0014]** The first web portion is positioned on the second web portion such that each of the printed portions of the first web portion are substantially superimposed over a corresponding printed portion of the second web portion to form a plurality of superimposed pairs of printed portions and such that each of the unprinted portions of the first web portion are substantially superimposed over a corresponding unprinted portion of the second web portion to form a plurality of superimposed pairs of unprinted portions.

**[0015]** The first and second web portions are sealed and severed along a plurality of first lines and a plurality of second lines to form a plurality of sleeves wherein each sleeve has an upper portion and a lower portion, with the lower portion having a printed portion extending continuously about the exterior circumference of the lower portion of the sleeve while the upper portion is free of any printing contained in the lower portion of an

adjacently formed sleeve. Each first line traverses each of the printed portions of one of the superimposed pairs of printed portions substantially proximate to the first side edges of the printed portions of the superimposed pair of printed portions and traverses each unprinted portion of a corresponding superimposed pair of unprinted portions substantially parallel and proximate to the first side edges of the printed portions of one of the adjacent superimposed pairs of printed portions. Each second line traverses each of the printed portions of one of the superimposed pairs of printed portions substantially parallel and proximate to the second side edges of the printed portions of the superimposed pair of printed portions and traverses each unprinted portion of the corresponding superimposed pair of unprinted portions substantially parallel and proximate to the second side edges of the printed portions of one of the oppositely adjacent superimposed pair of printed portions.

**[0016]** The objects, features and advantages of the present invention will become apparent from the following detailed description when read in conjunction with the accompanying drawings and appended claims.

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

**[0017]** FIG. 1 is a side elevational view of a prior art sleeve having a printed lower portion with a "racing stripe" on each side thereof and an unprinted upper portion.

**[0018]** FIG. 2 is a side elevational view of a prior art sleeve having a printed lower portion and an upper portion with an overlapping printed portion.

**[0019]** FIG. 3 is a side elevational view of a prior art sleeve having a continuously printed lower portion and an unprinted upper portion.

**[0020]** FIG. 4 is a plan view of a portion of a web of material illustrating a prior art printing and sealing pattern for forming the sleeve of FIG. 1

**[0021]** FIG. 5 is a plan view of a portion of a web of material illustrating a prior art printing and sealing pattern for forming the sleeve of FIG. 2.

**[0022]** FIG. 6 is a plan view of a portion of a web of material illustrating a prior art printing and sealing pattern for forming the sleeve of FIG. 3.

**[0023]** FIG. 7 is a plan view of a portion of a web of material illustrating a printing pattern constructed in accordance with the present invention for forming the sleeve of FIG. 3 with no excess material.

**[0024]** FIG. 8 is a plan view of the web of material of FIG. 7 illustrating the web of material folded in half and a cutting and sealing pattern for forming the sleeve of FIG. 3 with no excess material.

**[0025]** FIG. 9 is a perspective view of a portion of a pair of webs of sheet material illustrating another embodiment of a printing pattern constructed in accordance with the present invention for forming the sleeve of FIG. 3 with minimal excess material.

**[0026]** FIG. 10 is a plan view of the webs of material of FIG. 9 illustrating a cutting and sealing pattern for forming the sleeve of FIG. 3 with minimal excess material.

#### DETAILED DESCRIPTION OF THE INVENTION

**[0027]** Referring now to the drawings, and more particularly to FIGS. 1-3, shown therein and designated by the general reference numerals 10a, 10b, and 10c, respectively, are three examples of flexible bags or sleeves of unitary construction. Each of the sleeves 10a, 10b, and 10c comprises a flexible flattened piece of material which is openable into

the form of a tube or sleeve. Further, each of the sleeves 10a, 10b, and 10c is tapered outwardly from the lower end toward a larger diameter at its upper end. In its flattened state, each of the sleeves 10a, 10b, and 10c has an overall trapezoidal shape, and when opened, is generally substantially frusto-conical.

**[0028]** The sleeves 10a, 10b, 10c are constructed from any suitable material that is capable of being formed into a sleeve and wrapped about a pot and a floral grouping disposed therein. Preferably, the material comprises paper (untreated or treated in any manner), cellophane, metal foil, polymer film, non-polymer film, fabric (woven or nonwoven or synthetic or natural), cardboard, fiber, cloth, burlap, or laminations or combinations thereof.

**[0029]** The term "polymer film" means a man-made polymer such as a polypropylene or a naturally occurring polymer such as cellophane. A polymer film is relatively strong and not as subject to tearing (substantially non-tearable), as might be the case with paper or foil.

**[0030]** The material from which the sleeves 10a, 10b, and 10c are constructed preferably has a thickness in a range from about 0.1 mils to about 30 mils, although in some cases the sleeves may be much thicker, especially when the sleeves are constructed from multiple layers. Often, the thicknesses of the sleeves 10a, 10b, and 10c are in a range from about 0.5 mils to about 10 mils. Preferably, the sleeves 10a, 10b, and 10c have thickness in a range from about 1.0 mil to about 5 mils. More preferably, the sleeves 10a, 10b, and 10c are constructed from material which is flexible, semi-rigid, rigid, or any combination thereof. The sleeves 10a, 10b, and 10c may be constructed of a single layer



of material or a plurality of layers of the same or different types of materials. Any thickness of the material may be utilized as long as the material functions in accordance with the present invention as described herein. The layers of material comprising the sleeves 10a, 10b, and 10c may be connected together or laminated or may be separate layers. Such materials used to construct sleeves are described in U.S. Patent No. 5,111,637 entitled "Method For Wrapping A Floral Grouping" issued to Weder et al., on May 12, 1992, which is hereby incorporated herein by reference. Any thickness of material may be utilized in accordance with the present invention as long as the sleeves 10a, 10b, and 10c may be formed as described herein, and as long as the formed sleeves 10a, 10b, and 10c may contain at least a portion of a pot or potted plant or a floral grouping, as described herein. Additionally, an insulating material such as bubble film, preferable as one of two or more layers, can be utilized in order to provide additional protection for the item, such as the floral grouping, contained therein.

**[0031]** In one embodiment, the sleeves 10a, 10b, and 10c may be constructed from two polypropylene films. The material comprising the sleeves 10a, 10b, and 10c may be connected together or laminated or may be separate layers. In an alternative embodiment, the sleeves 10a, 10b, and 10c may be constructed from only one of the polypropylene films.

**[0032]** The sleeves 10a, 10b, and 10c may also be constructed, in whole or in part, from a cling material. "Cling Wrap or Material", when used herein, means any material which is capable of connecting to the sheet of material and/or itself upon contacting engagement during the wrapping process and is wrappable about an item whereby

portions of the cling material contactingly engage and connect to other portions of another material, or, alternatively, itself, for generally securing the material wrapped about at least a portion of a pot. This connecting engagement is preferably temporary in that the material may be easily removed, i.e., the cling material "clings" to the pot.

**[0033]** The cling material is constructed and treated if necessary, from polyethylene such as Cling Wrap made by GLAD®, First Brands Corporation, Danbury, Connecticut. The thickness of the cling material will, in part, depend upon the size of sleeve 10a, 10b or 10c, and the size of the pot in the sleeve 10a, 10b or 10c, i.e., generally, a larger pot may require a thicker and therefore stronger cling material. The cling material will range in thickness from less than about 0.1 mils to about 10 mils, and preferably less than about 0.5 mils to about 2.5 mils and most preferably from less than about 0.6 mils to about 2 mils. However, any thickness of cling material may be utilized in accordance with the present invention which permits the cling material to function as described herein.

**[0034]** It will generally be desired to use the sleeve 10a, 10b or 10c as a covering for a potted plant such as is well known in the art. The term "pot" as used herein refers to any type of container used for holding a floral grouping or plant. Examples of pots, used in accordance with the present invention include, but not by way of limitation, clay pots, wooden pots, plastic pots, pots made from natural mud/or synthetic fibers, or any combination thereof. The pot is adapted to receive a floral grouping in the retaining space. The floral grouping may be disposed within the pot along with a suitable growing medium described in further detail below, or other retaining medium, such as a floral foam. It will

also be understood that the floral grouping, and any appropriate growing medium or other retaining medium, may be disposed in the sleeve 10 without a pot.

**[0035]** The term "floral grouping" as used herein means cut fresh flowers, artificial flowers, a single flower or other fresh and/or artificial plants or other floral materials and may include other secondary plants and/or ornamentation or artificial or natural materials which add to the aesthetics of the overall floral grouping. The floral grouping comprises a bloom or foliage portion and a stem portion. Further, the floral grouping may comprise a growing potted plant having a root portion (not shown) as well. However, it will be appreciated that the floral grouping may consist of only a single bloom or only foliage, or a botanical item (not shown), or a propagule (not shown). the term "floral grouping" may be used interchangeably herein with both the terms "floral arrangement" and "potted plant". The term "floral grouping" may also be used interchangeably herein with the terms "botanical item" and/or "propagule."

**[0036]** The term "growing medium" when used herein means any liquid, solid or gaseous material used for plant growth or for the cultivation of propagules, including organic and inorganic materials such as soil, humus, perlite, vermiculite, sand, water, and including the nutrients, fertilizers or hormones or combinations thereof required by the plants or propagules for growth.

**[0037]** The term "botanical item" when used herein means a natural or artificial herbaceous or woody plant, taken singly or in combination. The term "botanical item" also means any portion or portions of natural or artificial herbaceous or woody plants including

stems, leaves, flowers, blossoms, buds, blooms, cones, or roots, taken singly or in combination, or in groupings of such portions such as bouquet or floral grouping.

**[0038]** The term "propagule" when used herein means any structure capable of being propagated or acting as an agent of reproduction including seeds, shoots, stems, runners, tubers, plants, leaves, roots or spores.

**[0039]** Referring now more specifically to FIG. 1, the sleeve 10a has an open upper end 12a, a lower end 14a, a sealed first edge 18a, a sealed second edge 20a, a first side 22a and a second side 24a. Preferably the lower end 14a is closed and provided with a gusset 26a, but it may be sealed along an edge. When the lower end 14a of the sleeve 10a has a closed bottom, the gusset 26a may take the form of any known gusset, such as an inwardly folded portion or an outwardly folded portion, as illustrated in FIG. 1. It should be appreciated that the gusset 26a permits a circular bottom of an object such as a potted plant to be disposed into the inner retaining space of the lower end 14a of the sleeve 10a.

**[0040]** The sleeve 10a is characterized as having an upper portion 28a and a lower portion 30a. The lower portion 30a is generally defined as being that portion of the sleeve 10a sized to extend about the exterior surface of a pot (not shown) when the pot is disposed in the sleeve 10a in a manner well known in the art. The upper portion 28a of the sleeve 10a is sized to substantially surround and encompass a floral grouping (not shown) extending from the pot.

**[0041]** The upper portion 28a and the lower portion 30a may be demarcated by a detaching element (not shown) for enabling the upper portion 28a to be selectively removed from the lower portion 30a. The term "detaching element" as used herein,

generally means any element or combination of elements or features, such as but not limited to, perforations, tear strips, tear starts, zippers, and any other devices or elements of this nature known in the art, or any combination thereof, which enable or facilitate the tearing away or detachment of one object from another. Therefore, while perforations are shown and described herein, it will be understood that tear strips, zippers, or any other "detaching elements" known in the art, or any combinations thereof, could be substituted therefor.

**[0042]** It should be noted that the sleeves 10b and 10c shown in FIGS. 2 and 3 are substantially identical in construction to the sleeve 10a described above. Therefore, for the sake of brevity, the sleeves 10b and 10c will not be described in detail, but like numerals are used to represent like components with the exception that components of the sleeves 10b and 10c are denoted with the letters "b" and "c", respectively.

**[0043]** As mentioned above, it is often desirable that the upper portion of the sleeve be substantially transparent or otherwise pervious to light to permit relatively unobstructed viewing of the floral grouping through the sleeve and that the lower portion be provided with a decorative designs or pattern.

**[0044]** With respect to the sleeve 10a, the lower portion 30a of the sleeve 10a is shown to have a printed area 32 which extends over the lower portion 30a of the sleeve 10a with the exception of an unprinted section or strip 34 adjacent the sealed edge 18a and an unprinted section or strip 36 adjacent the sealed edge 20a.

**[0045]** With respect to the sleeve 10b, the lower portion 30b of the sleeve 10b is shown to have a printed area 38 which extends over the entire lower portion 30b of the

sleeve 10b and further has a printed section 40 on the upper portion 28b adjacent the sealed edge 18b and a printed section or strip 42 adjacent the sealed edge 20b.

**[0046]** Finally, with respect to the sleeve 10c, the lower portion 30c of the sleeve 10c is shown to have a printed area 44 which extends over the entire lower portion 30c of the sleeve 10c with no overlapping printed portion being present on the upper portion 28c.

**[0047]** Of the three sleeves 10a, 10b, and 10c, the sleeve 10c is generally regarded as providing the preferred aesthetic appearance, as the sleeve 10c is free from a "racing stripe" which breaks up the continuity of the printed image around the circumferential area of the lower portion of the sleeve, and is also free of the "overlap" which is an indication of poor quality and partially impedes the view of the contents within the upper portion of the sleeve. FIGS. 4-6 illustrate prior art methods of forming the plurality of the sleeves 10a, 10b, and 10c, respectively, from a single folded web of material. It will be appreciated, however, that the sleeves 10a, 10b, and 10c are also commonly formed from pairs of overlapping webs or a tubular web.

**[0048]** Referring now to FIG. 4, shown is a portion of a single web of material 46 folded in half along line 48 and used for forming the sleeve 10a illustrated in FIG. 1. The web of material 46 is printed along a longitudinal axis with successive printed portions 50 which are spaced apart from each other so that web of material 46 may be sealed and cut along lines 52 and 54 in an unprinted portion. By sealing and cutting the web of material 46 along the unprinted portion, the unprinted strips 34 and 36 are formed adjacent each side edge in the lower portion 30a of each sleeve 10a. However, no material is wasted and no "overlap" is formed on the upper portion 28a of the sleeve 10a.

**[0049]** As shown in FIG. 5, the sleeves 10b are formed by providing a single web of material 56 having printed portions 58 which are diagonally opposed in mirror images except that each printed portion 58 extends longitudinally past the line along which an edge is to be formed. As a result, the printed portion 58 overlaps on to the upper portion 28b of the adjacent sleeve upon sealing and cutting the web of material 56 along lines 60 and 62, thereby forming the printed sections 40 and 42 on the upper portion 28b of the sleeve 10b. Like the method illustrated in FIG. 4, no portion of the web of material 56 is wasted in the forming of the sleeves 10b.

**[0050]** In forming of the sleeve 10c, illustrated in FIG. 6, a single web of material 64 is provided with a printed portion 65 along a lower portion of the web of material 64 while an upper portion of the web of material remains unprinted. The web of material 64 is sealed and cut along lines 66 and 68 to form a sleeve 10c and along lines 66a and 68a to form another sleeve 10c. An area 70 of the web of material 64 bounded by the lines 68 and 66a is discarded. As such, the sleeves 10c do not have unprinted edges or printing overlap in the upper portion thereof. However, this method requires that a significant amount of material be wasted in the process and an amount of material for forming more than one-half a sleeve every other sleeve formed is discarded. Because of the need for a method of forming a plurality of floral sleeves having a uniform design or pattern printed circumferentially thereabout without requiring the waste of significant portions of material, a need for an improved method of forming floral sleeves has been recognized.

**[0051]** FIGS. 7-10 illustrate improved methods of forming floral sleeves having continuous patterns imprinted circumferentially thereabout on a lower portion thereof.

These methods overcome the before-mentioned deficiencies of the prior art methods, and thus represent advancements in the state of the art relating to floral sleeves.

**[0052]** FIG. 7 shows a portion of a web of material 80 divided into a first web portion 84 and a second web portion 86 by dashed line 87.

**[0053]** The first web portion 84 is printed with a plurality of successive printed portions 88 extending along the longitudinal axis of the first web portion 84 in a staggered, inverted relationship. The first web portion 84 further has a plurality of corresponding unprinted portions 90. Each printed portion 88 of the first web portion 84 has a top edge 92, a bottom edge 94, a first side edge 96, and a second side edge 98. The first and second side edges 96 and 98 of each printed portion 88 of the first web portion 84 is angled outwardly from the bottom edge 94 to the top edge 92 such that each printed portion 88 has a generally trapezoidal shape. Further, each printed portion 88 is printed on the web of material 80 so that the first side edge 96 of each printed portion 88 is coextensive with the first side edge 96 of the adjacent printed portion 88, and the second side edge 98 of each printed portion 88 is coextensive with the second side edge 98 of the opposite adjacent printed portion 88.

**[0054]** Similarly, the second web portion 86 is printed with a plurality of successive printed portions 100 extending along the longitudinal axis of the second web portion 86 in a staggered, inverted relationship. The second web portion 86 further has a plurality of corresponding unprinted portions 102. Each printed portion 100 of the second web portion 86 has a top edge 104, a bottom edge 106, a first side edge 108, and a second side edge 110. The first and second side edges 108 and 110 of each printed portion 100 of the



second web portion 86 is angled outwardly from the bottom edge 106 to the top edge 104 such that each printed portion 100 has a generally trapezoidal shape. Further, the printed portions 100 are printed on the web of material 80 so that the first side edge 108 of each printed portion 100 is coextensive with the first side edge 108 of the adjacent printed portion 100, and a second side edge 110 of each printed portion 100 is coextensive with the second side edge 112 of the oppositely adjacent printed portion 100.

**[0055]** As illustrated in FIG. 8, the web of material 80 is folded along the line 87 to position the first web portion 84 on the second web portion 86 such that the printed portions 88 of the first web portion 84 are superimposed over the printed portions 100 of the second web portion 86 and the unprinted portions 90 of the first web portion are superimposed over the unprinted portions 102 of the second web portion 86.

**[0056]** A series of sleeves is in turn formed by sealing and severing the first and second web portions 84 and 86 along lines 112 defined by the coextensive first side edges 96 and 108, and the coextensive second side edges 98 and 110 of each of the printed portions 88 and 100, thereby forming a plurality of sleeves, similar to the sleeve 10c illustrated in FIG. 3. Each sleeve has an upper portion and a lower portion with the lower portion having a printed portion extending continuously about the exterior circumference of the lower portion of the sleeve while the upper portion is free of any printing contained in the lower portion of an adjacently formed sleeve.

**[0057]** It will be appreciated that the method illustrated in FIGS. 7 and 8 requires that the printed portions 88 of the first web portion 84 be superimposed on the printed portions 100 of the second web portion 86 with a high degree of precision and that the first and

second web portions 84 and 86 must be sealed and severed precisely along the coextensive edges of the printed portions 88 and 100 to form a series of sleeves wherein each sleeve has a printed portion that extends continuously about the exterior circumference of the lower portion of the sleeve without resulting in the waste of any material. FIGS. 9 and 10 illustrate another method of forming a series of sleeves which does not require the high degree of precision demanded in the method of FIGS. 7 and 8.

**[0058]** FIG. 9 shows a pair of webs of material or web portions 122 and 124 for use in forming a plurality of sleeves wherein each of the sleeves has an upper portion and a lower portion with the lower portion having a printed portion extending continuously about the circumference of the lower portion of the sleeve. The first web portion 122 is printed with a plurality of successive printed portions 126 extending along the longitudinal axis of the first web portion 122 in a staggered, inverted relationship. The first web portion 122 further has a plurality of corresponding unprinted portions 128. Each printed portion 126 of the web portion 122 has a top edge 130, a bottom edge 132, a first side edge 134, and a second side edge 136. The first and second side edges 134 and 136 of each printed portion 126 are angled outwardly from the bottom edge 132 to the top edge 130 such that each of the printed portions 126 has a generally trapezoidal shape. Further, the first web portion 122 is printed with the printed portions 126 such that the first side edge 134 of each printed portion is generally aligned with the first side edge 134 of the adjacent printed portion 126 so as to be parallel or coextensive with the first side edge 134 of the adjacent printed portion 126 and such that the second side edge 136 of each printed portion 126 is generally aligned with the second side edge 136 of the oppositely adjacently printed

portion 126 so as to be parallel or coextensive with the second side edge 136 of the oppositely adjacently printed portion 126.

**[0059]** It will be appreciated by those of ordinary skill in the art that the method illustrated in FIGS. 9 and 10 may be carried out to attain the advantages of forming sleeves with a printed portion extending continuously about the circumference of the lower portion of the sleeve without having to waste or discard a significant amount of material in the process even if the first and second edges of the printed portions are not coextensive with each other, as is illustrated in FIGS 9 and 10. However, less material is likely to be wasted or discarded when the first and second side edges of the printed portions are coextensive with each other.

**[0060]** Like the first web portion 122, the second web portion 124 has a plurality of successive printed portions 138 extending along the longitudinal axis of the second web portion 124 in a staggered, inverted relationship and a plurality of corresponding unprinted portions 140. Each printed portion 138 of the second web portion 124 has a top edge 142, a bottom edge 144, a first side edge 146, and a second side edge 148. The first and second side edges 146 and 148 of each printed portion 138 are angled outwardly from the bottom edge 144 to the top edge 142 such that each of the printed portions 138 has a generally trapezoidal shape. Further, the second web portion 124 is printed with the printed portions 138 such that the first side edge 146 of each printed portion 138 is generally aligned with the first side edge 146 of the adjacent printed portion 138 so as to parallel or coextensive with the first side edge 146 of the adjacent printed portion 138, and the second side edge 148 of each printed portion 138 is generally aligned with the second

side edge 148 of the oppositely adjacent printed portion 138 so as to be parallel or coextensive with the second side edge 148 of the oppositely adjacent printed portion 138.

**[0061]** As illustrated in FIG. 10, the first web portion 122 is positioned on the second web portion 124 such that the printed portions 126 of the first web portion 122 are substantially superimposed over the printed portions 138 of the second web portion 124 to form a plurality of superimposed pairs of printed portions 150. Further, the first web portion 122 is positioned on the second web portion 124 such that the unprinted portions 128 of the first web portion 122 are substantially superimposed over the unprinted portions 140 of the second web portion 124 to form a plurality of superimposed pairs of unprinted portions 152. As mentioned above, the method illustrated in FIGS. 9 and 10 does not require the printed portions 126 and the printed portions 138 to be superimposed with the precision of that required to carry out the method illustrated in FIGS. 7 and 8. To this end, FIG. 10 further illustrates the instance when the printed portions 126 of the first web portion 122 are slightly offset from, or misaligned with, the printed portions 138 of the second web portion 124, thereby obviating the method illustrated in FIGS. 7 and 8.

**[0062]** To overcome the fact that the printed portions 126 and 138 may not be exactly superimposed on each other, a series of sleeves is formed by sealing and severing the first and second web portions 122 and 124 along a plurality of first lines 154 and plurality of second lines 156. Each of the first lines 154 traverses one of the superimposed pairs of printed portions 150 such that the first line 154 traverses each of the printed portions 126 and 138 near the first side edges 134 and 148 of the web portions 122 and 124, respectively. Each of the first lines 154 further traverses each unprinted portion 128

and 140 of a corresponding superimposed pair of unprinted portions 152 proximate to the first side edges 134 and 146 of the printed portions 126 and 138 of the adjacent superimposed pair of printed portions 150 thereby forming a sealed first edge.

**[0063]** The second lines 156 traverse each of the printed portions 126 and 138 of the superimposed pairs of printed portions 150 proximate to the second side edges 136 and 148 of the printed portions 126, 138, respectively. Each of the second lines 156 further traverse each unprinted portion 128 and 140 of the corresponding superimposed pair of unprinted portions 152 proximate to the second side edges 136 and 148 of the printed portion 126 and 138 of the oppositely adjacent superimposed pair of printed portions 150, thereby forming a sealed second edge.

**[0064]** As shown in FIG. 10, each first line 154 is spaced from an adjacent first line 154 to form a strip of material 158 therebetween, and each second line 156 is spaced from an adjacent second line 156 to form a strip of material 160. Upon sealing and severing the first and second web portions 122 and 124 along the first lines 154 and the second lines 156, and discarding the strips of material 158 and 160, a plurality of sleeves 162 is formed. Because the first and second lines 154 and 156 traverse each of the printed portions 126 and 138 and traverse the corresponding unprinted portions 128 and 140, each of the sleeves 162 has an upper portion and a lower portion with the lower portion having a printed portion extending continuously about the exterior circumference of the lower portion of the sleeve while the upper portion is free of any printing contained in the lower portion of an adjacently formed sleeve. Furthermore, while some material must be discarded, the

amount of material discarded is significantly less than the amount of material discarded using the prior art method described above with reference to FIG. 6.

**[0065]** The methods of FIGS. 7-10 are carried out by intermittently advancing, in timed sequence aided with photoelectric eyes (not shown) a pair of webs of material, a single web of material folded upon itself, or even a tubular web of material to a sealing and severing station wherein a sealing bar (not shown) is activated to seal the overlapping web portions to form sleeves in accordance with the methods described above. Machines adaptable for producing sleeves in accordance with the methods of the present invention are well known in the art and available from Lemo Maschinenbau GmbH, Niderkassel-Mondorf, Germany, as well other manufacturers of bag-making machines.

**[0066]** From the above description it is clear that the present invention is well adapted to carry out the objects and to attain the advantages mentioned herein as well as those inherent in the invention. While presently preferred embodiments of the invention have been described for purposes of this disclosure, it will be understood that numerous changes may be made which will readily suggest themselves to those skilled in the art and which are accomplished within the spirit of the invention disclosed and as defined in the appended claims.